DOCUMENT RESUME

ED 379 706 CS 508 825

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TITLE The Relationship of Communication Apprehension to Communication Behavior: A Meta-Analysis.
PUB DATE 12 Feb 95
NOTE 21p.; WSCA 95 Paper presented at the Annual Meeting of the Western States Communication Association (Portland, OR, February 10-14, 1995).
PUB TYPE Speeches/Conference Papers (150) -- Reports - Evaluative/Feasibility (142) -- Information Analyses (070)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Communication Apprehension; Communication Problems; Communication Research; *Communication Skills; Higher Education; Literature Reviews; Meta Analysis; *Speech Communication; Undergraduate Students
IDENTIFIERS *Communication Behavior; ERIC; PsycLIT

ABSTRACT

Communication apprehension (CA) refers to a family of related terms: (a) reticence, (b) shyness, (c) unwillingness to communicate; and (d) stage fright. One pervasive but not totally substantiated assumption in current literature is the relationship between the level of communication apprehension and the level of communication skill demonstrated by an individual. The contemporary undergraduate communication curriculum often emphasizes training in communication to improve the communication skills of students. A study using meta-analysis as a method examined the relationship between CA and communication skill level by investigating the outcomes reported in a broad range of studies in the field of communication. Thirty studies (from computer searches on ERIC and Psyclit, and from examination of several bibliographies for manuscripts) met the selection criteria and were included in the overall analysis. The average correlation was positive and the sample was heterogeneous. This finding suggests that a moderator exists and that the average correlation represents an average across studies that differs by something other than sampling error. Basically, the impact of CA increases as the selection procedures become more rigorous. The impact demonstrates that a "superb" speaker (past three standard deviations) could be expected to be more than eight times more likely to be low in CA than high in CA. There is still a need for additional summaries of available literature examining the impact of CA on various communication outcomes. (Three tables of data are included. Contains 61 references.) (TB)

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The Relationship of Communication Apprehension to Communication Behavior: A Meta-Analysis

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Western States Communication Association Convention

February 12, 1995

Portland, Oregon

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The Relationship of Communication Apprehension to Communication Behavior: A Meta-Analysis

Abstract

This review examines the relationship between communication apprehension (CA) and communication behavior. The meta-analysis examines the consistency of the relationship between communication behavior and the level of CA experienced by individuals. The results indicate a consistent positive relationship between the level of CA and communication behavior ($\underline{r}$ = .23). The relationship was larger for the quality of communication ($\underline{r}$ = .26) then the quantity of communication produced ($\underline{r}$ = .17). The results indicate that CA is more related to quality of communication than to the quantity of communication by an individual.

The Relationship of Communication Apprehension to Communication Behavior: A Meta-Analysis

As a construct, communication apprehension (CA) remains central to many aspects of communication research. The anxiety and subsequent desire of a person to engage in various forms of interaction serves as an important aspect in understanding communication behavior (see Daly & McCroskey, 1984). The contemporary undergraduate communication curriculum often emphasizes training in communication to improve the communication skills of students (e.g., classes in public speaking, interviewing, argumentation, small group discussion, listening, and interpersonal communication.) Even when skill building is not a central emphasis, there exists a belief that instruction in the theoretical bases of communication indirectly contributes to communication skill.

Meta-analytic investigations of CA establish the effectiveness of methods for reducing levels of CA (Allen, 1989; Allen, Hunter, & Donohue, 1989), compare methods of measurement (Allen, 1989; Booth-Butterfield, 1989), and the cognitive consequences of apprehension (Bourhis & Allen, 1992). The results of the meta-analyses demonstrate that the level of CA experienced by an individual can be reduced with any of the common methods of treatment (cognitive modification, skills training, systematic desensitization), but that in combination the treatments are most effective. Booth-Butterfield (1989) demonstrates that state and trait measures are highly correlated and Allen (1989) demonstrates no differences on the basis of self-report, physiological, or observer measurement for treatment effectiveness.

The next step in analyzing the available data should consider the impact of CA on various communication behaviors as well as other outcomes. The Bourhis and Allen (1992) meta-analysis demonstrates a consistent pattern of correlations demonstrating that high levels of CA negatively correlates with a variety of measures of cognitive achievement. The average correlation is small ($\underline{r}$ = .10) but consistent and significant. The impact of a correlation of .10 is approximately a 20% difference in the proportion of scores past the mean when comparing high and low CA individuals (Rosenthal, 1984). The current literature summarizing the relationship of CA and its impact on communication behavior relies mostly on single studies of various features (Ayres & Hopf, 1993; Connell & Borden, 1987; Daly &

Stafford, 1984; Klopf, 1984; Richmond, 1984). Future development and understanding requires a consistent body of meta-analytic summaries of the available literature to understand what part CA plays in human interaction. This manuscript contributes to that understanding by examining the relationship between CA and communication behavior.

Communication Apprehension and Communication Behavior

Communication apprehension refers to a family of related terms including: (a) reticence, (b) shyness, (c) unwillingness to communicate, and (d) stage fright. While arguments exist about the appropriateness and applicability of the various terms and their corresponding measures, this review treats the conceptual definitions as sharing many elements in common. None of the meta-analyses to date demonstrate a heterogeneous finding explainable on the basis of divergent measurement techniques. This empirical evidence indicates that the approaches do not inevitably generate different or divergent results. This manuscript uses the term "communication apprehension" to indicate this family of terms but recognizes that the choice of the term is arbitrary relative to the choice of other possible terms for the conceptual domain.

One pervasive but not totally substantiated assumption in the current literature is the relationship between the level of CA and the level of communicative skill demonstrated by an individual. The assumption of most of the literature is that a person who experiences apprehension about communication is less likely to communicate skillfully. This assumption is both logical and necessary for the validity of measurement and theoretical assumptions.

A fundamental assumption of the skills training method of reducing CA (Kelly, 1984) is that individuals who experience CA do so because they lack the skill to communicate competently. The argument runs that a person should be anxious about an important event for which they lack the necessary skills to perform competently. Skills training treatment provides individuals with instruction and practice in how to communicate competently. The outcome of such training reduces the level of CA experienced by removing the cause of the apprehension (e.g., skill deficit). The person gains confidence in their ability to communicate and should view the experience as a challenge that they can meet successfully. The Dale

Carnegie approach (1926) in Public Speaking and Influencing Men in Business begins with chapter one, "Developing Courage and Self-Confidence." The Carnegie approach reflects the pedagogical choices of many educators who have students up and speaking as quickly as possible with confidence in the training they are offered.

People with high anxiety are likely to be less skilled communicators. This assumption pervades the CA literature. The cognitive modification technique known as "visualization" attempts to reduce apprehension by convincing communicators that they will be successful when communicating rather than failures. The available research (Ayres & Hopf, 1985, 1987, 1989, 1990) suggests that this reorientation of a person's perception helps to diminish their anxiety. However, none of the cited research here provided a behavioral or even self-report measure of communication skill. Although anxiety may be reduced, whether or not the reduction in anxiety is accompanied by a corresponding increase in communication skill level remains unkown.

This fundamental assumption deserves to be considered across the entire body of literature. While the logic is persuasive and straightforward, there exist equally persuasive alternative explanations. A person might not enjoy communicating but perform communicative behaviors often and well. The expectation is that a person apprehensive about an activity would structure their environment to avoid such activities. The probability of the person engaging in communication could be handled relatively easily. The avoidance of communication activities is documented across a variety of settings (Daly & Stafford, 1984). Such avoidance does not necessarily mean that a person performs poorly when required to communicate.

The second aspect deserves more careful consideration, whether a person with a high level of apprehension performs less well. Although a person may not like an activity, he/she may be able to maintain a high level of perceived competence. The assumption of many of the treatments of CA are efforts to reduce anxiety by increasing skills or changing assumptions about effectiveness. One preliminary way of establishing the need for such approaches is to demonstrate that persons with high levels of CA are less skilled communicators.

The relationship between communication apprehension and the performance of communication

behavior has not been clearly established. The current literature on CA reduction examines only CA reduction. When actual communication behaviors are examined, the behaviors are rated as to the level of those behaviors as they relate to anxiety. For example, a study may have a person give a speech and then raters evaluate the level of visible nervousness. This rating does not necessarily indicate the level of skill of the speaker. While one expects a visible sign of nervousness to diminish the skill of the communicator, this is not always the case. For example, although Jimmy Stewart and Mel Tillis stutter, both maintain reputations as skilled performers.

This summary considers the evidence for such a relationship by taking previous literature and summarizing that empirical research using meta-analysis. The summary should provide a case either for or against the nature of a relationship existing between CA and communication behavior.

Meta-Analysis as Method

Meta-analysis represents a method of statistical summarizing available literature (Hunter & Schmidt, 1990). Meta-analysis does not represent a purely "objective" method of summarizing available research. Instead the method provides a summary that uses a procedure that is explicit and can be replicated. The advantage of this procedure is that other persons can validate for themselves the methods and conclusions of the analysis. This contrasts with typical narrative reviews that seldom provide a detailed set of criteria for the literature search and the methods of inclusion of studies as well as the means of evaluating those studies.

A narrative review cannot consider Type I or Type II error within the method of the review. With an expected Type II error rate of about 50% in the social sciences, the ability to distinguish genuine from artifactual inconsistency in the literature is difficult if not impossible. The advantage of meta-analysis lies in the combination of intersubjective possibilities and the ability to address statistical artifacts (Preiss & Allen, 1984). Meta-analysis, by permitting persons to replicate the procedures means that the process can generate agreement among scientists. The ability to identify Type I and Type II error, as well as handle other statistical artifacts (regression to the mean, restriction in range, selection bias, attenuated measurement) provides a more accurate estimate of population parameters.

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The process should lead to an examination of the consistency of replications and the ability to direct future research meaningfully (Allen & Preiss, 1993). One capability of meta-analysis is the consideration of research taking place over time, the fact that a study was conducted in the 1930's permits a comparison to data in the 1990's. Meta-analyses making such comparisons typically find little difference in outcomes when assessing data collection over time (Bourhis & Allen, 1992; Dindia & Allen, 1992).

This particular meta-analysis examines the relationship between CA and communication behaviors in the existing literature. The examination requires the identification and extraction of effects from individual studies. The individual estimates are then averaged to assess the nature of the relationship between the variables of interest.

Methods

Literature Search

The literature acquisition relied on computer searches of Psyclit and ERIC using the terms "communication apprehension" and "public speaking anxiety". In addition, several bibliographies (Allen, Hunter, & Donohue, 1989; Bourhis & Allen, 1992; Clevenger, 1959; McCroskey, 1976, 1977; Porter, 1979; Richmond & Payne, 1984) were examined for manuscripts as well as the reference sections of all manuscripts obtained as a result of the prior methods.

The literature search had a definite set of limitations and parameters that excluded a large number of studies. An investigation to be included had to use a quantitative measure of communication apprehension as well as a quantitative measure of communication behavior. The important aspect is that the performance measure must NOT be a redundant measure of apprehension. As exemplified in many of the studies examining CA treatment (Allen, 1989), the measure of communication behavior often addresses whether the person "appears" to the observer to suffer symptoms of stage fright, or some other variant of the CA family (Clevenger & King, 1961; Dickens, Gibson, & Prall, 1950; Lerea, 1956).

The measure sought had to be a measure of the verbal output in simple quantitative terms. A person might speak longer, use less vocalized pauses, or get a higher grade for a speech assignment (key is that grade is based on performance not written test). The measure had to involve some measure of output that

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was not simply a redundant measure of CA. The investigation did not seek achange in attitude or behaviors as a result of the study, often measured in investigations (Ainsworth, 1949; Patton, 1966). Studies examining behavior in the classroom were similarly excluded (Peters, 1976).

The measure of communication had to involve some actual behavior that was observable. This criteria excluded self-report data as a means of establishing the quality or quantity of interaction for the individual. The goal was to examine actual behavior as opposed to self-reports of behavior and/or frequency of interaction. Evaluations or ratings of behavior based on raters or self-report data were included if the basis for the rating or the self-report involved an actual incidence of behavior.

The results of the literature search, extraction of effects, and coding results appear in Table 1. Some studies were excluded due to lack of available statistical information in the primary report that did not permit the estimation of an effect (e.g., Dymacek, 1970) or used qualitative data (e.g., Lederman, 1983).

Insert table 1 about here

Coding of Studies

Studies were coded for the type of behavioral output recorded within the investigation. The Type of output was recorded as one of two types: (a) quantity of communication behavior, or (b) quality of communication behavior. A measure of the quantity of communication behavior dealt with some measure of the amount of communication (duration of speech, number of words or hand movements). A measure of the quality of communication involved the evaluation of the performance of the communication behavior (speaker credibility, choice of communicative option, persuasiveness). There was no disagreement over the choice of categories for the particular study and no study used measures from both types.

Statistical Analysis

This meta-analysis uses the variance-centered method of meta-analysis as developed by Hunter and Schmidt (1990). This method of meta-analysis treats the estimates from each study as potentially drawn from the same sample of correlations. The sample of correlations is then averaged (weighting for the

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sample size of individual estimates). The average correlation is then tested for homogeneity and the possible existence of moderator variables.

The homogeneity test evaluates the assumption that the difference observed between studies is based only on sampling error. Essentially, the chi-square test indicates the degree to which the expected and actual variability compare. A nonsignificant chi-square indicates homogeneity while a significant chi-square indicates heterogeneity (implying the existence of moderator variables). The results of a "true" test for moderator variables will demonstrate homogeneous results within levels of the moderator and a significant mean difference between the average correlations of the groups used (Hall & Rosenthal, 1991).

Results

Overall

Thirty studies met the selection criteria and were included in the overall analysis. The average correlation (ave r = .217, N=2,837) was positive and the sample was heterogeneous ($X^2_{(29)}$ = 58.63, $p <$ .05). This finding suggests that a moderator exists and that the average correlation represents an average across studies that differs by something other than sampling error. The next section tests whether the difference is based on the distinction between quality or quantity as a dependent measure. A positive correlation indicates that a highly apprehensive person produces either lower quantity or quality of communication behavior.

Measures of Communication Quantity

There were sixteen studies of communication quantity that generated a positive (ave r = .275, N=1,147) homogeneous sample ($X^2_{(15)}$ = 22.88, $p > .05$). The test for this subset establishes that there exists less quantity of communication for those with higher levels of anxiety.

Measures of Communication Quality

The fourteen studies correlating communication quality and level of CA demonstrate a positive (ave r = .178, N=1,690) but heterogeneous sample ($X^2_{(13)}$= 29.08, $p > .05$). This indicates the overall average should be interpreted cautiously.

Conclusions

The conclusions demonstrate a positive relationship between the level of CA and communication behavior (r = .217). There does seem to be a lower correlation when considering quality (.178) versus quantity (.275) of communication. Even with the heterogeneity issue, Table 1 shows that all but one study reports a positive correlation. This indicates that while there may exist a moderator variable, the difference is in the magnitude of the positive correlation rather than in the direction of the correlation.

The importance of the particular overall average positive correlation (.217) can be displayed using the Binomial Effect Size Display (Rosenthal, 1984). The distinction between high and low CA is demonstrated clearly. Suppose we take the population and divide it at the median of CA level. Then 61.5% of the persons with a high level of CA will score lower than the median in communication behavior. Conversely, 39.5% of the low level CA persons will score with low levels of CA. This figure represents a 56% increase in the lower level communication behaviors attributed to low levels of CA. This represents an important classification of persons.

Insert table 2 about here

Another way of demonstrating the impact of this correlation is to examine the impact of various selection procedures. Suppose we took and divided the population into low and high levels of CA based on the median. The result of selecting at the mean, one, two, or three standard deviations past the mean would demonstrate the impact of the choices, as displayed in Table 3.

Insert table 3 about here

Basically, the impact of CA increases as the selection procedures become more rigorous. The impact demonstrates that we would expect a superb speaking (past three standard deviations) to be more than 8 times more likely to be low in CA than high in CA. This indicates that the impact of the distinction

between high and low levels of CA is most felt at the extreme ends of the continuum.

The need is for additional summaries of the available literature examining the impact of CA on various communication outcomes. This is particularly true for those aspects of CA relating to classroom performance and participation. Students afraid, unwilling, or unable to participate in educational procedures may continue to fail to benefit from educational efforts. This is particularly true when the instructional strategies utilized are inconsistent with those instructional strategies preferred by high and low CA students (Bourhis & Berquist, 1990; Bourhis & Noland, 1990; Bourhis & Stubbs, 1991).

The greatest need is for investigations tracking the course of remediation and the impact of that treatment on the subsequent development of the individual. While CA treatment works to lower the level of CA, there exists scant evidence that the reduced CA subsequently diminishes the impact of CA on the person's life. For example, do high CA students who have experienced diminished cognitive ability throughout their educational careers regain any of the lost cognitive ability after successful treatment? For this report the issue is whether a reduction in CA subsequently increases the quantity and/or quality of communication.

This investigation continues the effort at synthesizing and understanding the impact of communication apprehension on human communication behaviors. The results, while not surprising, point to a consistent (in terms of direction but not magnitude) body of findings. CA is associated with lower levels of communication behavior (as measured in quality or quantity). This finding points to the need to consider CA in investigations dealing with interaction where the desire to communicate can influence the findings.

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Table 1

List of Effects for Each Study

First Author	Year		N	r	Dependent Measure
Arntson	1980		60	+.390	Speaker Credibility
			18	+.349	Amount of Verbal Output
Ayres	1989		96	+.383	Speech Duration
Beatty	1986		69	+.262	Speech Duration
Booth-Butterfield	1986		79	+.189	Word Count, pauses, disfluencies, silence
Beatty	1988		53	+.411	Speech Selection Errors
Burgoon	1976		152	+.160	Amount of Participation
Burgoon	1984	A	90	+.066	Credibility and Nonverbal
		B	55	+.248	Nonverbal
Burgoon	1987	A	110	.000	Nonverbal
		B	60	+.096	Credibility and Nonverbal
Comadena	1977		74	.000	Hand Movements
Douglass	1947		170	+.415	Public Speech Evaluation
Hamilton	1972		71	+.390	Verbosity
Jensen	1978		327	+.143	Verbosity and Competence
Jordan	1978		60	+.109	Verbal Output
McMullen	1992		71	+.165	Powerless Language
Menzel	1994		119	+.080	Verbal Output
Mortensen	1977	A	72	+.220	Word Count, and Duration
		B	48	+.263	Word Count and Duration
		C	60	+.250	Word Count and Duration
		D	40	+.363	Word Count and Duration
		E	49	+.628	Duration
Moore	1943		49	+.254	Quality of Speech
Mulac	1975		42	+.415	Skill and Credibility
Pilkonis	1977		46	+.317	Speaking Duration
Powers	1980		410	+.150	Public Speech Evaluation
Remland	1989		51	+.593	Speech Duration
Sorensen	1972		122	+.210	Verbosity
Teigen	1977		115	+.190	Verbosity

Table 2

Binomial Effect Size Display of Results

	Level of	Communication
Level of CA	Low	High
High CA	61.5	39.5
Low CA	39.5	61.5

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Table 3

Binomial Effect Size Display for Interpreting Results

The following assumes that r = .22 and a scale with a mean = 50, standard deviation = 10 and that each group (High and Low CA) is equal in number.

Cutoff score	Percentage of persons past the cutoff score		Ratio of High to Low CA persons with behavior	Percentage chance that person past cutoff score is Low CA person
	Low CA	High CA		
> the mean "Above average communicator"	61.50%	39.50%	1.56 to 1	62%
> one SD "Excellent communicator"	23.89%	9.85%	2.43 to 1	71%
> two SD "Outstanding communicator"	4.36%	1.10%	3.96 to 1	80%
> three SD "Speaker of the Year"	0.34%	0.04%	8.50 to 1	89%